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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/673,376

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John A. Hughes

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1940 DUKE STREET

ALEXANDRIA, VA 22314

EXAMINER

ARANCIBIA, MAUREEN GRAMAGLIA

ART UNIT

PAPER NUMBER

1792

NOTIFICATION DATE

DELIVERY MODE

01/14/2008

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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**Office Action Summary**

Application No.

10/673,376

Applicant(s)

HUGHES ET AL.

Examiner

Maureen G. Arancibia

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 31 October 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-43 is/are pending in the application.
- 4a) Of the above claim(s) 2, 4-10, 12-17, 19, 21 and 23-39 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 3, 11, 18, 20, 22 and 40-43 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- 1) ☐ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 31 October 2007 has been entered.

### ***Claim Rejections - 35 USC § 112***

2. Applicant's amendment to Claim 1 has overcome the rejection under 35 U.S.C. 112, second paragraph. Specifically, the amendment to the preamble of Claim 1 has clarified that the subcombination of the processing element alone is being claimed.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. **Claims 1, 3, 11, 40, and 41 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 7,227,097 to Kumar et al.**

In regards to Claim 1 and 40, Kumar et al. teaches a processing element for a plasma processing system (Column 3, Lines 18-20), comprising: a passive polymeric

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component (*a passive plasma catalyst...capable of inducing a plasma by deforming a local electric field*, Column 9, Lines 2-11, which can be *an electrically conductive polymer or a polymer nanocomposite*, Column 10, Lines 3-8) that can have various shapes including that of a cylindrical ring (*annular*, Column 10, Lines 50-53) and is configured to erode when exposed to a plasma process in the plasma processing system (it is *consumed by the plasma*; ex. Column 11, Lines 37-43); and an active component included as a part of said passive component and configured to alter the chemistry of the processing when exposed to the plasma process (*an additive [that] can include any material that a user wishes to add to the plasma, such as a dopant or a precursor material that, upon decomposition, can form the dopant*; Column 11, Lines 1-17).

Kumar et al. further teaches that the plasma processing system can be used for semiconductor manufacture. (ex. *doping semiconductors*; Column 11, Lines 6-8)

The recitation that the passive polymeric component is disposed on a substrate holder and surrounding a substrate position in the semiconductor manufacturing system is considered to be a recitation of intended use of the subcombination of the claimed processing element, which the cylindrical ring-shaped processing element taught by Kumar et al. would be structurally capable of performing based on the shape of a substrate holder and the placement of the processing element in a particular system. It has been held that claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. *In re Danly*, 263 F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959). Also, a claim containing a "recitation with respect to the

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manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus” if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987)

In regards to Claims 3 and 11, Kumar et al. teaches that the active component can comprise a distribution of solid particles (*the additive*) encapsulated within the passive component (*the passive plasma catalyst*). (Column 11, Lines 1-54; Figure 3)

In regards to Claim 41, as discussed above in regards to Claim 1, the passive polymeric component taught by Kumar et al. is structurally capable of being disposed on a substrate support, in which case said polymeric component would have a plasma-exposed surface and a protected surface placed in contact with the substrate holder. If the polymeric component of Kumar et al. were used for such an intended use, the plasma-exposed surface would be inherently structurally capable of developing a greater surface area than the protected opposite surface, based on the pattern of erosion of the passive polymeric component caused by a particular plasma process performed in the manufacturing system. The recitation in Claim 41 that the plasma-exposed surface has a greater area than the surface in contact with a substrate holder has been interpreted as a recitation of intended use, since the support for this claim limitation that Applicant has identified in the original disclosure (ex. Figure 7D) illustrates that the plasma-exposed surface of the inventive component only develops a greater surface area through plasma processing and erosion. It has been held that claims directed to apparatus must be distinguished from the prior art in terms of structure

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rather than function. *In re Danly*, 263 F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959).

Also, a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987)

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. **Claims 18, 20, 22, 42, and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kumar et al. in view of U.S. Patent 5,556,500 to Hasegawa et al.**

The teachings of Kumar et al. were discussed above.

In regards to Claims 18 and 42, Kumar et al. further teaches that the processing element having a cylindrical ring shape (*annular*, Column 10, Lines 50-53) discussed in regards to Claim 1 can be positioned within a plasma processing system (Figure 6), which can be used for semiconductor manufacture (Column 11, Lines 6-8) and comprises: a processing chamber 165 configured to facilitate a plasma process; a gas distribution system (*gas port*, Figure 6) coupled to the processing chamber and configured to introduce a process gas to the processing chamber (see for example Column 5, Lines 3-6; Column 9, Lines 2-5); a plasma source (*a radiation source, such as a microwave source*, supplying electromagnetic radiation to a *radiation chamber* in

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which the processing chamber is placed to generate a plasma; see for example Figures 1 and 2; Column 1, Line 44 - Column 2, Line 37; Column 3, Lines 18-58; Column 9, Lines 1-11 and 35-55; Column 12, Lines 29-40) coupled to the processing chamber 165 due to the processing chamber being installed in radiation chamber 160 and configured to generate a plasma in the processing chamber; and the processing element itself as discussed in regards to Claim 1 (indicated at 170 in Figure 6), which may be considered to be coupled to the processing chamber 165 by being positioned within it (Figure 6), and to be *electromagnetically* coupled to the plasma source (Column 9, Lines 1-11 and Column 12, Lines 29-40), as broadly recited in the claim.

Kumar et al. does not expressly teach a substrate holder coupled to the processing chamber and configured to support a substrate to be processed, wherein the passive component is disposed on the substrate holder and surrounding the substrate position.

Hasegawa et al. teaches, in a plasma processing chamber 12, that a substrate holder 14 configured to support a substrate S to be processed by attracting and holding the substrate is provided, and that a passive component 104 that is configured to erode when exposed to a plasma process can have a cylindrical ring shape and can be disposed on the substrate holder 14 and surrounding a substrate position. (Figure 1; Column 3, Lines 54-59; Column 6, Lines 15-45; Column 9, Lines 36-47)

It would have been obvious to one of ordinary skill in the art to modify the apparatus taught by Kumar et al. to couple a substrate holder to the processing chamber, said substrate holder being configured to support a substrate to be

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processed, in order, as taught by Hasegawa et al. (Figure 1; Column 3, Lines 54-59), to expose a substrate such as a semiconductor wafer to a plasma process while securely attracting and holding the substrate during processing. It further would have been obvious to one of ordinary skill in the art to dispose the cylindrical ring shaped passive polymeric component taught by Kumar et al. on the substrate holder and surrounding the substrate position, as taught by Hasegawa et al., for the predictable result of exposing the passive polymeric component to the plasma process for erosion and release of the included active component.

In regards to Claims 20 and 22, see the discussion of Claims 3 and 11 above.

In regards to Claim 43, the plasma-exposed surface of the cylindrical ring shaped passive component taught by the combination of Kumar et al. and Hasegawa et al. would be inherently structurally capable of developing a greater surface area than the protected opposite surface in contact with the substrate holder, based on the pattern of erosion of the passive polymeric component caused by a particular plasma process performed in the manufacturing system. The recitation in Claim 43 that the plasma-exposed surface has a greater area than the surface in contact with a substrate holder has been interpreted as a recitation of intended use, since the support for this claim limitation that Applicant has identified in the original disclosure (ex. Figure 7D) illustrates that the plasma-exposed surface of the inventive component only develops a greater surface area through plasma processing and erosion. It has been held that claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. *In re Danly*, 263 F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959).



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Also, a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987)

### ***Response to Arguments***

7. Applicant's arguments filed 31 October 2007 have been fully considered but they are not persuasive.

Specifically, in regards to Applicant's argument that Kumar et al. alone does not teach the limitations of Claim 1 as amended, this argument is not persuasive, since Kumar et al. expressly teaches that the passive polymeric component can have an annular (i.e. cylindrical ring) shape (Column 10, Lines 50-53). Furthermore, Claim 1 recites only the subcombination of the processing element alone; the recitation that said processing element is disposed on a substrate holder and surrounding a substrate position is considered as a recitation of intended use that the processing element of Kumar et al. would be structurally capable of performing. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.

In so far as Applicant argues that combining the teachings of Kumar et al. with a teaching to place the processing element surrounding a substrate position would be non-obvious due to theoretical negative effects such as particle generation, the test for

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obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).


### ***Conclusion***


8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maureen G. Arancibia whose telephone number is (571) 272-1219. The examiner can normally be reached on core hours of 10-5, Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
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